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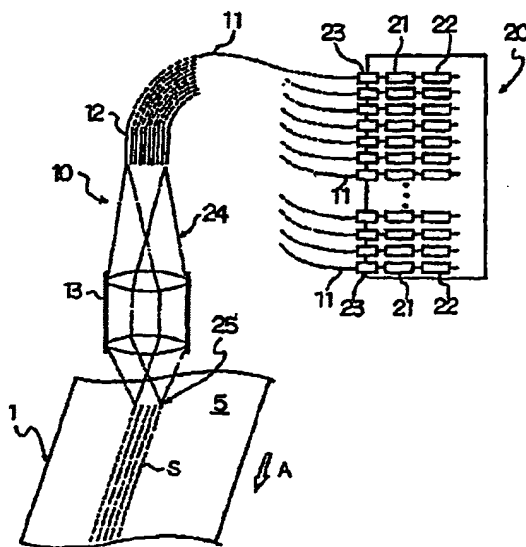
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(54) **METHOD OF WRITING SERVO SIGNAL ON MAGNETIC TAPE**

(57) A method of writing servo signals on a magnetic tape which comprises irradiating one end of an optical fiber bundle (12) comprising a plurality of optical fibers (11) arrayed in parallel with each other with laser light, transmitting the laser light (24) emitted from the other end as an output light source through a condensing lens (13), and irradiating a site of a magnetic tape running at a prescribed speed, the site being capable of forming

servo tracks, with the laser light passed through the condensing lens (13) to form real images (25) equal to or smaller in size than the output light source to cause the site to change physically or chemically thereby forming a plurality of servo track patterns (S) in the longitudinal direction of the tape at a smaller pitch than the pitch of the optical fibers (11) arrayed in the optical fiber bundle (12).

FIG.1



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1

EP 1 205 912 A1

2

Description

Technical Field:

[0001] The present invention relates to a method and an apparatus for writing servo signals on a magnetic tape, by which servo tracks can be formed at a small pitch.

Background Art:

[0002] One of means for increasing the recording capacity of magnetic tape is to increase the density of data tracks. However, as the track density increases, the distance between adjacent data tracks is shortened, and it becomes more likely that the magnetic head strays off the right position during data recording or reproduction, failing to keep accuracy of recording or reproduction. Various servo tracking systems have been proposed to address this problem.

[0003] One of typical servo tracking systems for magnetic tape is formation of servo tracks corresponding to servo signals on a magnetic tape magnetically or by mechanical stamping. According to this system, the smaller the distance between servo tracks formed, the more accurate the servo control. To achieve this, however, a complicated or large-sized apparatus is required.

[0004] Accordingly, an object of the present invention is to provide a method and an apparatus for writing servo signals on a magnetic tape which will make it possible to easily form a large number of servo tracks at a small pitch.

Disclosure of the Invention:

[0005] The present invention accomplishes the above object by providing a method of writing servo signals on a magnetic tape which comprises irradiating one end of an optical fiber bundle comprising a plurality of optical fibers arrayed in parallel with each other with laser light, transmitting the laser light emitted from the other end as an output light source through a condensing lens, and irradiating a site of a magnetic tape running at a prescribed speed, the site being capable of forming servo tracks, with the laser light passed through the condensing lens to form real images equal to or smaller in size than the output light source to cause the site to change physically or chemically thereby forming a plurality of servo track patterns in the longitudinal direction of the tape at a smaller pitch than the pitch of the optical fibers arrayed in the optical fiber bundle.

[0006] The present invention also provides an apparatus for writing servo signals on a magnetic tape, which is preferably used to carry out the above-mentioned method, which comprises a system for running magnetic tape, a system for writing servo signals on the magnetic tape (hereinafter, servo signal writing system), and a light source system providing laser light incident upon

the servo signal writing system, wherein:

the servo signal writing system has an optical fiber bundle where a plurality of optical fibers are arrayed in parallel to each other with the center axes of the individual optical fibers being coplanar and a condensing lens which receives the laser light emitted from the end of the optical fiber bundle, the optical fiber bundle and the lens being disposed such that the direction in which real images of the output laser light source formed through the lens are aligned and the running direction of the magnetic tape may make an angle larger than 0° and smaller than 90° when viewed from above.

[0007] The present invention also provides an apparatus for writing servo signals on a magnetic tape which comprises a system for running magnetic tape, a system for writing servo signals on the magnetic tape (hereinafter, servo signal writing system), and a light source system providing laser light incident upon the servo signal writing system, wherein:

the servo signal writing system has a group of two or more optical fiber bundles each having a plurality of optical fibers arrayed in parallel to each other with the center axes of the individual optical fibers being coplanar, the optical fiber bundles being superposed on each other in such a manner that real images may be formed at a smaller pitch than the pitch of real images formed by the individual optical fiber bundles.

Brief Description of the Drawings:

[0008]

Fig. 1 schematically illustrates a first embodiment of the servo signal writing apparatus according to the present invention.

Fig. 2 is a schematic cross section showing the structure of an optical fiber bundle.

Fig. 3 schematically shows the way of forming servo tracks on magnetic tape, seen from above.

Fig. 4 is a schematic view of a servo signal writing system in a second embodiment of the servo signal writing apparatus according to the present invention,

Fig. 5 schematically shows another mode of a servo signal writing system in the first embodiment.

Best Mode for Carrying out the Invention:

[0009] The present invention will be hereunder described with reference to its preferred embodiments by way of the accompanying drawings. Figs. 1 through 3 illustrate a first embodiment of the servo signal writing apparatus according to the present invention. As shown